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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,216	09/16/2004	Naoki Hayashida	257336US0PCT	5561

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EXAMINER

ZIMMER, MARC S

ART UNIT PAPER NUMBER

1712

DATE MAILED: 03/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/507,216

Applicant(s)

HAYASHIDA ET AL.

Examiner

Marc S. Zimmer

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1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5 and 7-22 is/are rejected.
- 7) ☒ Claim(s) 4 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/16/04, 11/22/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 7-8, 10-11, and 13-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al., U.S. Patent # 5,783,260. Kato discloses a process in column 4, lines 1-24 that mirrors the instantly claimed method in every step. Descriptions of the organic-type composition and silicone-type composition are provided in columns 5 and 6. An addition embodiment of the invention contemplated by Kato et al is one wherein a silane coupling agent is added to the mixed composition that represents the abrasion-resistant hardcoat-forming mixture (column 6, lines 13-19). The advantages associated with their incorporation are described in column 7, lines 19-26. The silicone-type composition is said to possess silanol groups that are available for reaction with the hydrolyzable groups of the silane coupling agent.

Beginning at column 8, line 47, there is a restatement of the method by which a composite coating containing an abrasion resistant layer and a water repellant layer, which of course is equivalent to the anti-staining layer presently claimed, is prepared. The method entails polymerizing the organic components, UV and electron beam

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energy sources are mentioned in column 5, lines 50-56), followed by solvent removal. Thereafter, formation of the water repellant layer is promoted wherein a fluoroalkyl-functionalized silane is applied to the abrasion-resistant underlayer comprising a not-yet completely polymerized/cured silicone fraction. Because there remain in the silicone fraction unreacted silanol groups, the silane bearing hydrophobic and oleophobic fluoroalkyl groups may be chemically bonded to the underlayer during polycondensation thereby resulting in the realization of a water repellant layer that has a robust bonding interaction with the contents of the abrasion-resistant layer.

Claims 1, 3, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kamitani et al., U.S. Patent # 6,465,108. Kamitani discloses articles on which are formed silica base coatings using a specified process. Relevant to the present discussion, it is further considered that the silica layer may be employed as a primer that forms chemical bonds to organosilanes that are subsequently applied to the article. See the paragraph bridging columns 6 and 7. The organosilanes are the monomers from which water/oil repellant films may be derived and are preferably those containing fluoroalkyl substituents (column 8, lines 41-47 and 63-67).

Claims 1, 3, 5, 8, 11, 13-14, 16-18, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kashiwabara et al., JP 7-290639. They disclose the production of an article possessing both abrasion resistance and water repellence comprising a metal- or glass substrate on which is provided a polysilazane layer and subsequently a layer of a coating material having fluorine atom content that, in one favored embodiment is a perfluoroalkylsilane (paragraph 15). According to the abstract and paragraph 18,

the polysilazane layer is dried and cured at a low temperature that leaves silane-reactive moieties available for reaction with the perfluoroalkylsilane that is subsequently applied.

Applicant should note that, in all of the above cases, the base layer effectively adheres to Applicant's characterization of what constitutes a half-cured layer insofar as each reference explicitly states that the underlayer is formed in such a fashion that reactive groups are retained for later reaction with moieties contributed by the water repellant layer-forming material, usually a perfluoroorgano-substituted silane.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 12, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al., U.S. Patent # 5,783,260. Kato does not expressly disclose a preferred thickness concerning that of the anti-staining layer. However, it is the position of the Examiner that layer thickness in the context of a composite article is always a result-effective variable and, therefore, is subject to optimization based on the properties sought. "Discovering an optimum value of a result effective variable involves only routine skill in the art." *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Furthermore, it is taught in various places in the prior art that films derived from the polycondensation of silanes are susceptible to greater internal stresses that lend to a

weakening of the film when the thickness dimension becomes too large. It is, therefore, repeatedly advocated that similarly constituted films not exceed about 100 nm in thickness.

As for claim 22, Kato only expressly identifies automobile windshields as substrates to be treated in the manner suggested. Nonetheless, the reference teaches the invention as an improvement over other prior art approaches that targeted a similar outcome, to convey both abrasion resistance and a low-surface energy to a resin glass substrate. That is to say, there would be an immediate recognition by the skilled artisan that the materials and methodologies elucidated therein could be applied to other substrates in which similar properties are sought. Certainly, at least optical lenses for personal eyewear are frequently coated with abrasion resisting and anti-soiling materials insofar as they are highly vulnerable to being scratched and/or soiled (fingerprinted) in everyday use.

Claims 2, 11-14, 16-18, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamitani et al., U.S. Patent # 6,465,108. Interestingly, Kamitani does not expressly mention the introduction of heat as a means of simultaneously curing the hard coat and water/oil repellant layers. Rather, it is stated simply that the functional film may be applied by one of several conventional techniques at the bottom of column 10. However, the skilled artisan will appreciate that polymerizing/polycondensing/curing this layer into a film, and the concomitant joining of the silica base layer and water repellant layer, may be promoted by heating the coated article just as it had been suggested for the preparation of the silica primer layer (column 8, lines 12-19).

As before, Kamitani fails to teach a preferred thickness for the water repellant layer. This limitation is, nevertheless, obvious in light of the ubiquitous recognition that this variable is result-effective and the documented observation that similarly constituted films having a thickness greater than 100 nm possess internal stresses that weaken the film.

Allowable Subject Matter

Claims 4 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Takahashi et al., U.S. patent Application Publication No. 2004/0021966 discloses a similar article wherein the anti-staining layer comprises a silazane compound but the effective filing date of the application summarized by this reference does not antedate that of the present application. Iwato et al., U.S. patent # 6,649,273 discloses another composite article featuring an abrasion resistant underlayer derived from a polysilazane.

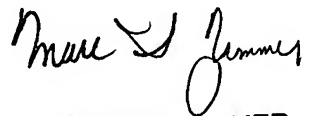
As an aside, there are numerous references that have been deemed "X" references by the ISA. The Examiner is inclined not to agree insofar as they all seem to fail to disclose an equivalent hard coat underlayer (e.g. JP 2000-117902) and/or a top layer that would not be expected to possess anti-staining attributes (e.g. JP 3-2701) due to absence of hydrophobic substituents on the silane. In any case, the Examiner has requested translations of each "X" reference so that a later determination of the relevance of these documents may be made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 571-272-1096. The examiner can normally be reached on Monday-Friday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 27, 2006


MARC S. ZIMMER
PRIMARY EXAMINER